

11/14/2001

Serial No.: 08/747,857

File 345:Inpadoc/Fam.& Legal Stat 1968-2001/UD=200144  
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S1 1 PN="US 5905514"  
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1/39/1  
DIALOG(R)File 345:Inpadoc/Fam.& Legal Stat  
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14096076

Basic Patent (No,Kind,Date): GB 9723937 A0 19980107 <No. of Patents: 009>

Patent Family:

Patent No	Kind	Date	Applic No	Kind	Date	
DE 19749669	A1	19980514	DE 19749669	A	19971110	
GB 9723937	A0	19980107	GB 9723937	A	19971112	(BASIC)
GB 200114722	A0	20010808	GB 200114722	A	19971112	
GB 200115608	A0	20010815	GB 200115608	A	20010626	
GB 2319224	A1	19980520	GB 9723937	A	19971112	
GB 2360016	A1	20010912	GB 200114722	A	19971112	
GB 2319224	B2	20010808	GB 9723937	A	19971112	
JP 10138502	A2	19980526	JP 97302872	A	19971105	
US 5905514	A	19990518	US 747857	A	19961113	

Priority Data (No,Kind,Date):

US 747857 A 19961113  
GB 9723937 A3 19971112

PATENT FAMILY:

GERMANY (DE)

Patent (No,Kind,Date): DE 19749669 A1 19980514

SYSTEM ZUM NASSREINIGEN EINES DRUCKKOPFES MIT DIREKTEM KONTAKT (German)

Patent Assignee: HEWLETT PACKARD CO (US)

Author (Inventor): RHOADS WISTAR W (US); JOHNSON ERIC JOSEPH (US);

CASTLE STEVE (US); DROGO FRANK (US); FERRARO JOHN (US); MARTINSON

PAUL E (US); MATTIS ERIC (US)

Priority (No,Kind,Date): US 747857 A 19961113

Applic (No,Kind,Date): DE 19749669 A 19971110

IPC: \* B41J-029/17

Derwent WPI Acc No: \* G 98-243447

Language of Document: German

GERMANY (DE)

Legal Status (No,Type,Date,Code,Text):

DE 19749669 P 19961113 DE AA PRIORITY (PATENT  
APPLICATION) (PRIORITAET (PATENTANMELDUNG))

DE 19749669 P 19971110 DE AE DOMESTIC APPLICATION (PATENT  
APPLICATION) (INLANDSANMELDUNG  
(PATENTANMELDUNG))

DE 19749669 P 19980514 DE A1 LAYING OPEN FOR PUBLIC  
INSPECTION (OFFENLEGUNG)

DE 19749669 P 20010809 DE 8127 NEW PERSON/NAME/ADDRESS OF  
THE APPLICANT (AENDERUNG IN PERSON, NAMEN  
ODER WOHNORT DES ANMELDERS)

HEWLETT-PACKARD CO. (N.D.GES.D.STAATES  
DELAWARE), PALO ALTO, CALIF., US

## GREAT BRITAIN (GB)

Patent (No,Kind,Date): GB 9723937 A0 19980107  
WET-WIPING PRINTHEAD CLEANING SYSTEM (English)  
Patent Assignee: HEWLETT PACKARD CO  
Priority (No,Kind,Date): US 747857 A 19961113  
Applic (No,Kind,Date): GB 9723937 A 19971112  
Derwent WPI Acc No: \* G 98-243447  
Language of Document: English  
Patent (No,Kind,Date): GB 200114722 A0 20010808  
WET-WIPING PRINTHEAD CLEANING SYSTEM (English)  
Patent Assignee: HEWLETT PACKARD CO  
Priority (No,Kind,Date): GB 9723937 A3 19971112; US 747857 A  
19961113  
Applic (No,Kind,Date): GB 200114722 A 19971112  
Derwent WPI Acc No: \* G 98-243447  
Language of Document: English  
Patent (No,Kind,Date): GB 200115608 A0 20010815  
WET WIPING PRINTHEAD CLEANING SYSTEM (English)  
Patent Assignee: HEWLETT PACKARD CO  
Priority (No,Kind,Date): US 747857 A 19961113  
Applic (No,Kind,Date): GB 200115608 A 20010626  
Derwent WPI Acc No: \* G 98-243447  
Language of Document: English  
Patent (No,Kind,Date): GB 2319224 A1 19980520  
WET WIPING PRINTHEAD CLEANING SYSTEM (English)  
Patent Assignee: HEWLETT PACKARD CO (US)  
Author (Inventor): RHOADS W WISTAR; JOHNSON ERIC JOSEPH; CASTLE STEVE;  
DROGO FRANK; FERRARO JOHN; MARTINSON PAUL E; MATTIS ERIC  
Priority (No,Kind,Date): US 747857 A 19961113  
Applic (No,Kind,Date): GB 9723937 A 19971112  
National Class: \* B6F FLR FLR  
IPC: \* B41J-002/165  
Derwent WPI Acc No: \* G 98-243447; G 98-243447  
Language of Document: English  
Patent (No,Kind,Date): GB 2360016 A1 20010912  
WET-WIPING PRINTHEAD CLEANING SYSTEM AND COMPOSITE WIPER THEREFORE  
(English)  
Patent Assignee: HEWLETT PACKARD CO (US)  
Author (Inventor): MATTIS ERIC (US); DROGO FRANK (US); FERRARO JOHN  
(US); MARTINSON PAUL E (US); RHOADS W WISTAR (US); JOHNSON ERIC  
JOSEPH (US); CASTLE STEVE (US)  
Priority (No,Kind,Date): GB 9723937 A3 19971112; US 747857 A  
19961113  
Applic (No,Kind,Date): GB 200114722 A 19971112  
National Class: \* B6F FLR FLR  
IPC: \* B41J-002/165  
Derwent WPI Acc No: \* G 98-243447  
Language of Document: English  
Patent (No,Kind,Date): GB 2319224 B2 20010808  
WET-WIPING PRINTHEAD CLEANING SYSTEM (English)  
Patent Assignee: HEWLETT PACKARD CO (US)  
Author (Inventor): RHOADS W WISTAR (US); JOHNSON ERIC JOSEPH (US);  
CASTLE STEVE (US); DROGO FRANK (US); FERRARO JOHN (US); MARTINSON  
PAUL E (US); MATTIS ERIC (US)  
Priority (No,Kind,Date): US 747857 A 19961113  
Applic (No,Kind,Date): GB 9723937 A 19971112

11/14/2001

Serial No.:08/747,857

National Class: \* B6F FLR FLR  
IPC: \* B41J-002/165  
Derwent WPI Acc No: \* G 98-243447  
Language of Document: English

GREAT BRITAIN (GB)

Legal Status (No,Type,Date,Code,Text):

GB 2319224	P	19961113	GB AA	PRIORITY (PATENT)
			US 747857 A	19961113
GB 2319224	P	19971112	GB AE	APPLICATION DATA (APPL.
			DATA)	
			GB 9723937 A	19971112
GB 2319224	P	19980520	GB A1	APPLICATION PUBLISHED
			(APPL. PUBLISHED)	
GB 2319224	P	20010509	GB 732E	PROCEEDING UNDER SECTION 32
			PATENTS ACT 1977	(PROC. UNDER SECT. 32 PAT.
			ACT 1977)	
GB 2319224	P	20010808	GB B2	PATENT GRANTED
GB 2360016	P	19961113	GB AA	PRIORITY (PATENT)
			US 747857 A	19961113
GB 2360016	P	19971112	GB AA	APPLICATION NO OF BASIC
			APPLICATION (APPL. NO OF BASIC APPL.)	
			GB 9723937 A3	19971112
GB 2360016	P	19971112	GB AE	APPLICATION DATA (APPL.
			DATA)	
			GB 200114722 A	19971112
GB 2360016	P	20010912	GB A1	APPLICATION PUBLISHED
			(APPL. PUBLISHED)	

JAPAN (JP)

Patent (No,Kind,Date): JP 10138502 A2 19980526  
CLEANING UNIT OF PRINT HEAD OF INK JET PRINTER (English)  
Patent Assignee: HEWLETT PACKARD CO  
Author (Inventor): RHOADS WISTAR W; JOHNSON ERIC JOSEPH; CASTLE STEVE;  
DROGO FRANK; FERRARO JOHN; MARTINSON PAUL E; MATTIS ERIC  
Priority (No,Kind,Date): US 747857 A 19961113  
Applic (No,Kind,Date): JP 97302872 A 19971105  
IPC: \* B41J-002/165  
Derwent WPI Acc No: \* G 98-243447  
Language of Document: Japanese

UNITED STATES OF AMERICA (US)

Patent (No,Kind,Date): US 5905514 A 19990518  
SERVICING SYSTEM FOR AN INKJET PRINTHEAD (English)  
Patent Assignee: HEWLETT PACKARD CO (US)  
Author (Inventor): RHOADS W WISTAR (US); JOHNSON ERIC JOSEPH (US);  
CASTLE STEVE (US); DROGO FRANK (US); FERRARO JOHN (US); MARTINSON  
PAUL E (US); MATTIS ERIC (US)  
Priority (No,Kind,Date): US 747857 A 19961113  
Applic (No,Kind,Date): US 747857 A 19961113  
National Class: \* 347033000; 347031000  
IPC: \* B41J-002/165  
Derwent WPI Acc No: \* G 98-243447  
Language of Document: English

UNITED STATES OF AMERICA (US)

Legal Status (No,Type,Date,Code,Text):

US 5905514	P	19961113	US AE	APPLICATION DATA (PATENT)
				(APPL. DATA (PATENT))

Serial No.: 08/747,857

US 747857 A 19961113  
25 US AS02 ASSIGNMENT OF ASSIGNOR'S  
INTEREST  
HEWLETT-PACKARD COMPANY 3000 HANOVER STEET  
LEGAL DEPARTMENT, M/S 20BN PALO ALTO, ;  
ROADS, W. WISTAR : 19970710; JOHNSON, ERIC  
JOSEPH : 19961101; CASTLE, STEVE : 19970701;  
DROGO, FRANK : 19970711; FERRAR : 19961031;  
518 US A PATENT  
321 US RF REISSUE APPLICATION FILED  
(REISSUE APPL. FILED)  
20010517

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0 513 833 A2	11/1992	*	European Patent Office (EPO)	
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59-45162	3/1984	*	Japan	
59-209876	11/1984	*	Japan	
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3-99857	4/1991	*	Japan	
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4-307256	10/1992	*	Japan	347#33
4-338552	11/1992	*	Japan	
5-162320	6/1993	*	Japan	347#33
6-234221	8/1994	*	Japan	

**PRIM-EXMR:** Le, N.**ASST-EXMR:** Tran, Thien**LEGAL-REP:** Potts; Jerry R.

**CORE TERMS:** fluid, applicator, reservoir, wiping, printer, orifice, ink, foam, pen, porous, service station, container, wick, carriage, layer, alternate, roller, sled, servicing, elastomeric, capillary, tumbler, wheel, appreciated, partially, cleaning, nozzle, pump, cap, transferred

**ABST:**

A wet-wiping printhead cleaning system for inkjet printer incorporating a wiper for wiping the printhead including a treatment fluid applicator configured for placing treatment fluid onto at least one element of the printhead and wiper elements involved in wiping the printhead orifice plate surface, the treatment fluid being placed on said at least one element by direct contact of the applicator, subsequently the wiper wipes the printhead, the treatment being available to enhance cleaning effectiveness, the treatment fluid lubricating the wiper so as to lengthen wiper service life and enhance wiping performance, as well as acting to render unwanted accumulations on the printhead more removable by wiping.

**NO-OF-CLAIMS:** 26**EXMPL-CLAIM:** 1**NO-OF-FIGURES:** 42**NO-DRWNG-PP:** 21**PARCASE:****RELATED APPLICATIONS**

This application is related to three other co-owned applications filed concurrently herewith, namely: U.S. patent application Ser. No. 08/747,855 filed on Nov. 13, 1996 entitled WET-WIPING PRINthead CLEANING SYSTEM USING A TRANSFER ELEMENT, HP Docket No. 10961139; U.S. patent application Ser. No. 08/747,884 filed on Nov. 13, 1999 entitled

Source: All Sources > Area of Law - By Topic > Patent Law > Patents > U.S. Patents > Utility Patents **i**  
Terms: **5905514** ([Edit Search](#))

*Pat. No. 5905514, \**

5,905,514

◆ GET 1st DRAWING SHEET OF 21

May 18, 1999

Servicing system for an inkjet printhead

**REISSUE:** Reissue Application filed May 17, 2001 (O.G. Aug. 21, 2001) Ex. Gp.: 2861; Re. S.N. 09/859,692

**INVENTOR:** Rhoads, W. Wistar, Escondido, California  
Johnson, Eric Joseph, Encinitas, California  
Castle, Steve, Philomath, Oregon  
Drogo, Frank, San Marcos, California  
Ferraro, John, San Diego, California  
Martinson, Paul E., Escondido, California  
Mattis, Eric, La Jolla, California

**ASSIGNEE-AT-ISSUE:** Hewlett-Packard Company, Palo Alto, California (02)

**APPL-NO:** 747,857

**FILED:** Nov. 13, 1996

**INT-CL:** [6] B41J 2#165

**US-CL:** 347#33; 347#31

**CL:** 347

**SEARCH-FLD:** 342#33, 28, 22, 23, 31, 32; 15#256.05; 134#169R; 347#33, 28, 22, 23, 31, 32; 400#701

**REF-CITED:**

**U.S. PATENT DOCUMENTS**

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5,635,965	6/1997	*	Purwins et al.	
5,706,038	1/1998	*	Jackson et al.	
5,793,389	8/1998	*	Mitchell	347#28

WET-WIPING PRINTHEAD CLEANING SYSTEM USING A PRINTHEAD TREATMENT FLUID STORED IN A NON-FLOWABLE STATE, HP Docket No. 10961134; and U.S. patent application Ser. No. 08/747,883 filed Nov. 13, 1999 entitled WET-WIPING PRINTHEAD CLEANING SYSTEM USING A NON-CONTACT TECHNIQUE FOR APPLYING A PRINTHEAD TREATMENT FLUID, HP Docket No. 10961138.

## **SUM:**

### **BACKGROUND OF THE INVENTION**

#### **1. Field of the Invention**

The present invention relates to the cleaning of printheads in computer-driven printers of the type generally known as inkjet printers. More particularly, the invention relates to such cleaning in printers employing a "wiper" which slidingly engages and wipes a nozzle orifice plate surface of a printhead to remove excess ink and accumulated debris to improve printhead performance and print quality.

#### **2. Description of the Related Art**

Ink-jet printing systems typically operate by ejecting ink from a plurality of small, closely-spaced nozzles located on the printhead. For proper functioning, an ink-jet printhead must be routinely serviced.

During printing, stray droplets of ink, dust, paper fibers and other debris can accumulate around the nozzles on the orifice plate surface and interfere with the trajectory of subsequently ejected ink droplets, thereby affecting print quality. To minimize this, the ink-jet printhead can be cleaned by intermittently wiping the orifice plate surface to remove the accumulated ink and debris.

During periods of inactivity, ink in the nozzles can dry or harden, plugging the nozzles. Thus, ink-jet printheads may be capped to maintain an appropriate environment around the nozzles and to postpone their clogging. This capping may be done automatically after a short period of inactivity, even during the middle of printing a page, if the printer is waiting for more data.

Inkjet printers generally have a printhead service station to which an inkjet printhead is moved by the carriage, and a cap which sealingly contacts the printhead is generally located at the service station. At the service station, the printhead (or multiple heads if such are used) are occasionally cleaned and, if necessary, primed with ink. For use in this cleaning function wipers are located at the service station. The service station can include a "sled" carrying these elements and others required to service the one or more printheads of the printer. This sled itself can be moved transversely to an axis of motion of the printhead carriage, for example in a vertical direction, so as to bring the caps or wipers for example into or out of contact with the printhead. Alternatively, a tumbler can be provided at the service station, and wipers, as well as caps, can be located on the tumbler. Rotation (and in some cases also vertical movement) of the tumbler effects wiping of the printhead, and/or alignment of one or more caps with one or more printheads positioned adjacent the tumbler at the service station.


To improve printing speed and the clarity and contrast of the printed image, recent advancements in the art have focused on improving the ink itself. For example, to provide faster, more waterfast printing with darker blacks and more vivid colors, improved pigment-based inks for inkjet applications have been developed. These pigment-based inks have a higher suspended solids content than earlier dye-based inks. Both types of ink dry quickly, which allows inkjet printing mechanisms to use plain paper. However, the combination of small nozzles and quick-drying ink leaves the printheads susceptible to clogging, in this case not only from the dried ink and minute dust particles or paper fibers, but also from the solids within the inks themselves. Further, this dried ink is more difficult to remove than previously



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1/1 PLUSPAT - (C) QUESTEL-ORBIT- image

PN - US5905514 A 19990518 [US5905514]

TI - (A) Servicing system for an inkjet printhead

PA - (A) HEWLETT PACKARD CO (US)

IN - (A) RHOADS W WISTAR (US); JOHNSON ERIC JOSEPH (US); CASTLE STEVE (US); DROGO FRANK (US); FERRARO JOHN (US); MARTINSON PAUL E (US); MATTIS ERIC (US)

AP - US74785796 19961113 [1996US-0747857]

PR - US74785796 19961113 [1996US-0747857]

IC - (A) B41J-002/165

EC - B41J-002/165C3

PCL - ORIGINAL (O) : 347033000; CROSS-REFERENCE (X) : 347031000

DT - Corresponding document

CT - US4306245; US5051758; US5300958; US5339098; US5396271; US5552811; US5635965; US5706038; US5793389; EP0465260 A2; EP0513833 A2; EP0671272 A2; JP59-14693; JP59-14962; JP59-45163; JP59-45162; JP59-209876; JP2-202452; JP3-90362; JP3-99857; JP4-37556; JP4-307256; JP4-338552; JP5-162320; JP6-234221

STG - (A) United States patent

AB - A wet-wiping printhead cleaning system for inkjet printer incorporating a wiper for wiping the printhead including a treatment fluid applicator configured for placing treatment fluid onto at least one element of the printhead and wiper elements involved in wiping the printhead orifice plate surface, the treatment fluid being placed on said at least one element by direct contact of the applicator, subsequently the wiper wipes the printhead, the treatment being available to enhance cleaning effectiveness, the treatment fluid lubricating the wiper so as to lengthen wiper service life and enhance

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Serial No.:08/747,857

wiping performance, as well as acting to render unwanted accumulations on the printhead more removable by wiping.

1/1 LGST - (C) LEGSTAT  
PN - US 5905514 [US5905514]  
AP - US 747857/96 19961113 [1996US-0747857]  
DT - US-P  
ACT - 19961113 US/AE-A  
APPLICATION DATA (PATENT)  
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- 19970725 US/AS02  
ASSIGNMENT OF ASSIGNOR'S INTEREST  
HEWLETT-PACKARD COMPANY 3000 HANOVER STEET LEGAL DEPARTMENT, M/S 20BN  
PALO ALTO, \* RHOADS, W. WISTAR : 19970710; JOHNSON, ERIC JOSEPH :  
19961101; CASTLE, STEVE : 19970701; DROGO, FRANK : 19970711; FERRAR :  
19961031;  
- 19990518 US/A  
PATENT  
- 20010821 US/RF  
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20010517  
UP - 2001-40

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AN - 3149852  
PN - 5,905,514 A 19990518 [US5905514]  
PA - Hewlett-Packard Co  
PT - E (Electrical)  
ACT - 20010116 REASSIGNED  
MERGER

Assignor: HEWLETT-PACKARD COMPANY DATE SIGNED: 05/20/1998

Assignee: HEWLETT-PACKARD COMPANY INTELLECTUAL PROPERTY ADMINISTRATION  
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OG - 2001-08-21  
CO - REA  
ACT - REISSUE APPLICATION FILED  
SH - REISSUE APPLICATION FILED